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Electricity Auction Plan, Reforms:
Questions Loom Over Execution and Infrastructure

Pakistan's Minister for Power Sardar Awais Leghari has announced the government's plan to auction surplus electricity to industries.

This initiative, designed to stimulate industrial growth and create job opportunities, was detailed in a press statement from the Ministry of Energy in January.

Leghari explained that the surplus electricity would be sold competitively, aiming to maximize benefits for Pakistan's economy and industrial sector.

He also discussed the National Electric Vehicle (EV) Policy, which seeks to promote electric vehicles across the country. To make EVs more affordable, electricity tariffs for EV charging stations have been significantly reduced. This step, he said, supports the government's broader goal of promoting sustainable energy solutions and reducing environmental impact.

However, energy experts have raised concerns regarding the feasibility of these plans on two key fronts. First, they question the accuracy of Pakistan's claimed power generation and distribution capacity.

Although the government asserts a power generation capacity of 43,000 MW, experts argue that this number is misleading, as there is a significant gap between installed capacity and actual generation capacity. Many power plants often operate below their full potential, and as a result, the actual generation capacity is much lower than reported. They say the system cannot distribute more than 22000 MW of electricity.

Secondly, experts are concerned about the ability of Pakistan's distribution companies, known as Discos, to handle the increasing demands of power distribution. Senior engineers have pointed out that these companies lack the infrastructure and capacity to effectively manage the power they generate.

One senior engineer highlighted the situation at HESCO, a Disco in Sindh, which struggles to manage medium voltages due to defective switches caused by continuous load-shedding. According to the engineer, only NTDC (National Transmission and Despatch Company) can manage such

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Industry to increase reliance on the DISCOs distribution system

'SLA to be signed between DISCOs, industrial consumers with captive generation'

The Power Division has issued a special directive to all electricity distribution companies, including K-Electric, regarding the execution of exclusive service level agreements with industries that have captive power generation.

The division has directed the distribution companies to sign a service agreement with the industry with captive generation. A Service Level Agreement (SLA) to be signed between electricity distribution companies (DISCOs), and industrial consumers with captive generation, says the directive.

The purpose of this SLA is to encourage the consumers to increase reliance on the DISCOs distribution system by offering competitive terms and conditions and to ensure a reliable, uninterrupted and quality electricity supply to meet the consumer's industrial requirements," said two separate letters written to chief executive officers of all ex-Wapda Discos and KE by the Power Division.

"In view of above, it is requested to get this service level agreement (SLA) vetted by your legal team and approved at the appropriate level. This agreement is in addition to and does not replace or override the conditions and parameters of the Distribution Code, Grid Code and the Consumer's Service Manual, and any other applicable document/rules," said the letter. The spokesman of Power Division said that the objective of these service level agreements is to enhance reliance on the transmission system of electricity distribution companies.

These agreements will include provisions ensuring a stable, reliable, and high-quality electricity supply to these industries, catering to their specific needs. In case of non-compliance or violations by distribution companies, penalties will be imposed. Initially, these agreements are proposed to be for a period of two years. The agreements will also cover mechanisms for addressing technical faults in electricity supply and their resolution. A structured mechanism for resolving disputes arising under these agreements will also be outlined. The directive instructed all electricity distribution companies to fulfill the legal requirements for these service level agreements immediately. -- ERMD

Electricity Auction Plan, Reforms: Questions Loom Over Execution and Infrastructure

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tasks, yet the situation in HESCO and other Discos remains dire. "How will the government execute its plans when these companies are so devastated?" the engineer questioned. He further noted that a Disco in Sindh had been supposed to complete 12 to 13 projects to install new grid stations and substations, but these projects remain incomplete.

The engineer also revealed a troubling incident in Hyderabad a few years ago, where a transformer explosion resulted in several fatalities. The cause was traced back to faulty equipment—12 transformers in the city had been installed using diesel instead of oil for cooling. This disaster, the engineer emphasized, was a stark example of the ongoing inefficiencies and risks in the country's power distribution network.

In addition to addressing these challenges, Leghari outlined several reforms in the energy sector. These include efforts to reduce electricity tariffs, eliminate circular debt, and address inefficiencies in the pricing system, which he described as unsustainable. The government is also revising agreements with Independent Power Producers (IPPs) to ensure greater transparency and long-term sustainability. Revisions are also planned for government-owned IPPs in the next phase. By 2025, the government will no longer oversee electricity trade, and instead, consumers and power companies will negotiate electricity purchases directly. This shift is expected to foster competition and benefit all stakeholders. Industrial estates and economic zones will also soon take over the management of their own power distribution systems, reducing inefficiencies and encouraging industrial activity.

Leghari also mentioned the ongoing privatization of electricity distribution companies and efforts to reduce the tax burden on consumers.

On the topic of coal-based power plants operated by Chinese companies, Leghari revealed that these plants would transition from using imported coal to locally mined coal from the Thar region. This move is expected to reduce import costs and strengthen the local economy.

In a separate meeting, Leghari briefed US Ambassador Natalie A. Baker on recent reforms in the power sector. He emphasized the government's commitment to appointing independent boards of directors for state-owned enterprises to ensure merit-based decision-making. Baker invited Leghari to participate in the Energy Security Dialogue in Washington, underscoring the importance of his involvement. – ER Report

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A Shaky Resolution: Chinese Nationals Withdraw Petition After Alleged Harassment

In a dramatic twist that unfolded just weeks ago, six Chinese citizens who had initially filed a petition before the Sindh High Court (SHC) against alleged police harassment in Karachi took a step back and sought to withdraw their complaint.

The legal proceedings had garnered significant attention, adding further strain to the already sensitive relationship between Pakistan and China.

On January 24, the SHC had issued notices to several key government bodies, including the Ministry of Foreign Affairs, the Chinese Embassy in Pakistan, and various provincial law enforcement agencies, following a petition filed by four Chinese men—Xu Hui, Zhang Lichun, Zeng Fanxiong, Liuhaiguang—and two women, Deng Huan Yang and Zhita. The petitioners claimed they had faced repeated harassment by the Sindh police over a period of six to seven months. According to their allegations, the police unjustly restricted their movements, detained them without cause, and even demanded bribes, all of which they said were an infringement on their fundamental rights, guaranteed by both international law and Pakistan's Constitution.

These claims quickly made headlines, sparking outrage and controversy. The Sindh Home Minister ordered an immediate investigation into the accusations, but there was a twist when he later argued that the petition itself was not valid, as the petitioners had not followed the correct legal protocol.

Despite this setback, the petitioners, through their lawyer Peer Rehman Mehsud, filed an application on January 28 requesting the withdrawal of their petition. The application cited assurances from senior government officials who had approached the petitioners and promised to address their grievances in accordance with the law. The petitioners, reportedly satisfied with these assurances, no longer wished to pursue the matter further, although they did reserve the right to take legal action in the future should the need arise.

"After the order dated January 24, 2025, we were approached by the authorities and assured that our concerns would be addressed properly," the application stated. "Having been satisfied with the steps taken, we wish to withdraw the petition. However, we reserve our rights for any future legal action if necessary."

While the withdrawal of the petition seemed to resolve the immediate tension, the underlying issues seem far from settled. The allegations had drawn attention to a broader problem: the treatment of Chinese nationals in Pakistan, especially in the context of the $60 billion China-Pakistan Economic Corridor (CPEC) project. CPEC had entered its second phase, with major investments flowing into infrastructure, energy, and industrial projects across the country. However, as the project advanced, Chinese citizens working on it had increasingly become targets of harassment, threats, and even attacks, particularly from militant groups such as the Balochistan Liberation Army (BLA).

The petitioners had also claimed that police were taking bribes to allow them to leave their homes and even sealed industrial units belonging to other Chinese nationals without prior notice under the guise of "security concerns." Additionally, they described how their arrival at Karachi's airport had become an ordeal, with long waiting times before being allowed to leave for their residences in bulletproof vehicles, at significant personal cost.

Sindh's police chief, Ghulam Nabi Memon, defended the security measures, noting that the BLA and other extremist groups had targeted Chinese nationals in Pakistan in the past. He argued that the additional security precautions, including bulletproof vehicles and tight surveillance, were necessary to protect the lives of Chinese workers involved in the CPEC projects. However, he also acknowledged that certain Chinese nationals had expressed frustration with the restrictions on their movement, which were compounded by the unwillingness of local sponsors to bear the costs associated with their protection.

This series of events left both countries grappling with the delicate balance between ensuring security and maintaining the trust of foreign investors. For Pakistan, this was not just a matter of policing—it was a matter of national importance. The CPEC was seen as a cornerstone of Pakistan's economic future, a critical project that required stable relations with China, its largest investor and partner. Any setbacks or disputes, however small, had the potential to derail progress and create long-lasting diplomatic rifts.

While the withdrawal of the petition may have temporarily quelled the tension, the incident underscored the fragility of the situation. China had invested billions of dollars into CPEC, and any security issues or legal obstacles faced by its nationals could have consequences for the project. The Pakistani government, while addressing the immediate concerns, now faced the difficult task of ensuring that Chinese investors felt safe and respected while operating within Pakistan.

As the second phase of CPEC moves forward, both countries will need to work carefully to navigate these sensitive issues—whether they concern police misconduct, security, or the safety of foreign nationals—in order to ensure that their partnership remains intact and continues to thrive. – ER Report

CDWP approves dev projects of worth over Rs.250 bn

The Central Development Working Party (CDWP) has approved 16 development projects with an estimated total cost of Rs259.68 billion, of which Rs200 billion ($710 million) will be funded through foreign assistance.

Ahsan Iqbal, the Planning Minister and Deputy Chairman of the Planning Commission, chaired the meeting where the projects were reviewed.

The committee recommended that the Executive Committee of the National Economic Council (Ecnec) formally approve seven projects worth Rs232.28 billion. Meanwhile, the CDWP itself approved nine projects, totaling Rs27.40 billion.

The CDWP's approval powers are limited to projects with costs up to Rs7.5 billion, while higher-value projects require Ecnec's endorsement after the CDWP's technical clearance.

Education and Training Sector Projects

• Danish School System Expansion: The CDWP approved the expansion of the Danish School System to Shigar and Sultanabad Jutal in Gilgit-Baltistan, and Bhimber in Azad Kashmir, with a combined cost of Rs9 billion.

• Cadet College in Kharan: A new cadet college will be constructed in Kharan at a cost of Rs2.945 billion.

• Merit and Need-based Scholarship Program (Phase-II): This scholarship program, supported by USAID, has been approved at a cost of Rs2.955 billion.

• Prime Minister's Pakistan Fund for Education: This Rs14 billion initiative, aiming to set up an endowment fund for scholarships, was referred to Ecnec for formal approval.

Governance and Public-Private Partnership Projects

• Sindh Provincial Support Project: A governance-related project, "Enhancing Public-Private Partnership in Pakistan," was referred to Ecnec. It has an estimated cost of Rs27.8 billion, which will be financed through a combination of ADB loans, FCDO grants, and contributions from the Sindh government.

Sports and Physical Planning Projects

• Arshad Nadeem/Shehbaz Sharif High-Performance Sports Academy: A sports academy at Islamabad Sports Complex will be established at a cost of Rs2.679 billion. It aims to train 50 elite athletes across 10 disciplines, including athletics, boxing, judo, and more.

• Expo Centre in Quetta: This Rs4.83 billion project will establish an expo centre in Quetta, designed to boost regional business activities.

• Islamabad Techno Polis Infrastructure Development: A project to develop infrastructure for Islamabad Techno Polis at an estimated cost of Rs1.99 billion was also approved.

Energy and Infrastructure Projects

• 220kV Transmission Network: A Rs11.316 billion project for a new transmission network in Islamabad and Burhan will be referred to Ecnec. The project aims to improve the National Transmission and Dispatch Company's (NTDC) transmission capacity, particularly for power from the Tarbela dam's fifth extension.

• Karachi's Green Line Bus System: The installation of integrated intelligent transport equipment for Karachi's Green Line bus service was proposed at an estimated Rs13.5 billion. This will improve the existing 21km infrastructure and acquire 80 articulated buses, enhancing the public transportation system.

Flood Emergency and Rehabilitation Projects

• Sindh Flood Emergency Rehabilitation Program: A Rs88.4 billion flood rehabilitation initiative in Sindh was referred to Ecnec. The project, primarily funded by the World Bank, aims to restore critical infrastructure and improve resilience, focusing on road restoration, water supply rehabilitation, and strengthening food security in flood-affected districts.

Road Development Projects

• Rawalpindi-Kahuta Road Dualization: A proposal for dualizing and rehabilitating a 28km stretch of road connecting Rawalpindi to Azad Kashmir has been referred to Ecnec for approval. This strategic road serves both civilian and defense needs.

This diverse range of projects spans multiple sectors—education, governance, sports, energy, infrastructure, and emergency rehabilitation—and covers various provinces across Pakistan. Through this comprehensive approach, the government is aiming to bolster regional development and improve the socio-economic fabric of the nation. -- ERMD

Free E-Bikes for 'Khelta Punjab Games' Winners: Unlocking Mobility and Future Prospects

Punjab Chief Minister Maryam Nawaz Sharif announced free e-bikes for 2,200 athletes who emerged victorious in divisional-level competitions of the 'Khelta Punjab Games' 2025.

Inaugurating what her government dubbed the largest sports event in Pakistan's history, she emphasized the Punjab government's commitment to youth development and enhancing sports opportunities.

The announcement from Punjab Chief Minister Maryam Nawaz Sharif holds significant potential for improving the mobility and opportunities for young athletes in the province, both directly and indirectly. Here's an analytical perspective on the impact of this initiative:

People's Mobility

Free E-Bikes for Athletes: The provision of free e-bikes to 2,200 victorious athletes will enhance their mobility and ease of travel, particularly for those living in rural or underdeveloped areas. E-bikes are an affordable, eco-friendly mode of transport, allowing athletes to move quickly and efficiently for training, competitions, or general mobility. For many athletes, especially those from less accessible areas, this is a significant benefit that directly addresses mobility barriers.

Expansion of Sports Infrastructure

The Chief Minister's commitment to developing sports facilities across the province, especially focusing on neglected sports fields, will create a better infrastructure that athletes can use to hone their skills. This not only facilitates mobility within sports communities but also ensures that sports facilities are more accessible to young talent from all areas of Punjab.

Improved Employment and Economic Opportunities

By launching an easy loan scheme for unemployed youth (ranging from Rs. 10 lakh to Rs. 3 crore), the government is promoting financial mobility. This initiative can empower young people to start their businesses, thus improving their financial independence and creating a ripple effect in terms of local economic growth. With improved access to capital, individuals may have more flexibility in their employment choices, which could include furthering their athletic or educational pursuits.

Encouraging Education and Sports Development

By placing a focus on youth education alongside sports, this initiative promotes holistic development. It ensures that young individuals are not confined to just one sphere but can balance academic progress with physical training. This can lead to a more well-rounded generation that is equipped for diverse opportunities, including those that may improve geographic mobility, such as scholarships or work opportunities abroad.

Strengthening Unity and National Pride

The Chief Minister's speech on national unity, focusing on sports and education, implicitly promotes a sense of belonging and shared purpose. Youth from all parts of Punjab, regardless of background, can envision themselves as part of a larger national movement for progress, which can inspire them to pursue mobility, whether through sports, education, or entrepreneurship.

Revival of Traditional Events (Horse & Cattle Show)

The revival of events like the Horse & Cattle Show not only serves to enhance cultural mobility by preserving traditional heritage, but also promotes tourism and social integration across different regions of Punjab. Events like this attract visitors from across the province and beyond, which can result in greater interaction, mobility, and economic activity.

Challenges & Considerations

While the announcement presents several promising benefits for mobility, there are also practical challenges that need to be considered:

Implementation and Access

Ensuring that all athletes have equal access to e-bikes, especially those from marginalized or remote areas, could be logistically challenging. There may be issues related to maintenance, distribution, or ensuring that athletes can make use of the bikes in areas with insufficient infrastructure.

Sustainability

For long-term success, the Punjab government would need to ensure that the facilities and initiatives, like the loan schemes and sports fields, are sustainable and are not just one-time investments. Continued funding and maintenance are key to ensuring the benefits continue for future generations.

Inclusivity

While the scheme emphasizes the importance of education and sports for youth, there should be an inclusive approach that ensures all young people, including those with disabilities or from less privileged backgrounds, have access to these opportunities.

Overall, the initiatives outlined by Punjab's Chief Minister have the potential to significantly improve both the mobility and future prospects of young people in the province. By focusing on practical support for athletes, expanding economic opportunities, and fostering a more inclusive environment, the government's plans promote long-term mobility that spans social, economic, and geographic boundaries. – Engineering Review Report

Cholistan Canal project at center of storm

The federal government, led by the Pakistan Muslim League-Nawaz (PML-N), is preparing to present the proposed Cholistan Canal project, along with other canals under the Green Pakistan Initiative, to the Council of Common Interests (CCI). This move comes amidst rising tensions with the Pakistan Peoples Party (PPP)-led Sindh government.

Musadik Malik, the Federal Minister for Petroleum Division and Water Resources, confirmed that a CCI meeting is being convened to address unresolved issues concerning the construction of several canals, including the Cholistan Canal. Sindh's position is that the Cholistan Canal is part of the Green Pakistan Initiative and its approval hinges on CCI's consent, which has not been granted yet.

In February 2024, the Executive Committee of the National Economic Council (ECNEC) conditionally approved a plan titled "Development of National Irrigation Network for Green Pakistan Initiative." However, to address concerns raised by the provinces, the approval was made contingent on CCI's decision. This initiative includes the construction of various canals, such as the Cholistan Canal, Greater Thal Canal, Kachhi Canal, Rainee Canal, Thar Canal, and Chashma Right Bank Canal (CRBC).

The Ministry of Planning, however, has requested the Cabinet Division to amend the minutes of the ECNEC meeting concerning the Cholistan Canal. The Ministry argues that the decision only pertained to the Greater Thal Canal, and the Cholistan Canal was mistakenly included in the minutes. The Ministry is now asking the Cabinet Division to correct this record.

Sindh is adamant that the Cholistan Canal must be reviewed by the CCI, as per the ECNEC's decision. The proposed correction to the meeting minutes would allow the project to bypass the CCI's review, further complicating the situation.

The controversy over the Cholistan Canal intensified after the federal government removed the project from the agenda of the ECNEC meeting, following strong opposition from Sindh. The Sindh government insisted that the construction of the canal must be tied to CCI's approval.

Sindh has serious concerns regarding the issuance of a water availability certificate for the project. The province argues that the flood flows may not be sufficient to operate the canal.

From 2019 to 2023, water shortages were reported at 13.7% for Punjab and 19.4% for Sindh. Sindh believes that such shortages make the construction of new canals unfeasible. Additionally, the province argues that building the Cholistan Canal would worsen the already critical situation in the Indus delta, where environmental water flows of 8.6 million acre-feet (MAF) have not been guaranteed. Sindh also points out that the increasing number of "no-flow" days and the intrusion of seawater into the coastal region are exacerbating the issue.

Despite these objections, the Central Development Working Party (CDWP) approved the construction of the Cholistan Canal and its Phase I system, with an estimated cost of Rs225.340 billion. During the CDWP meeting, Sindh's representative called for a delay in approval until the CCI made a final decision on the project, citing concerns over the potential negative impact on lower riparian areas in Sindh. -ERMD

ASHRAE Seminar

Life & Fire Safety Hazards of New Refrigerants

The ASHRAE Pakistan Chapter successfully hosted a crucial seminar on "Life & Fire Safety Hazards of New Refrigerants" on Friday, 17th January 2025, at the ASHRAE Office.

The seminar aimed to address the critical safety challenges associated with the adoption of new refrigerants in the HVACR industry.

The session was led by Tariq Moen, Founder and Director Training of the Fire Protection Association of Pakistan (FPAP), who captivated the audience with his in-depth analysis of the challenges and safety risks posed by low-global warming potential (GWP) refrigerants. His insights provided clarity on emerging issues, industry readiness, and the steps required to enhance safety across HVACR systems.

Key Discussion Points and Takeaways:

1. Emerging Safety Risks: The shift to low-GWP refrigerants introduces fire and toxicity risks, requiring new handling and installation practices to mitigate hazards.

2. Regulatory Frameworks: A detailed discussion on compliance with international standards, including NFPA, ASHRAE, and ISO guidelines, was presented.

3. Industry Readiness: The session highlighted the growing need for training programs and certifications to equip professionals for safe refrigerant use.

4. Innovative Solutions: Cutting-edge fire suppression technologies and safe design strategies were explored to enhance safety in residential, commercial, and industrial HVACR applications.

5. Collaborative Efforts: Attendees were encouraged to collaborate and adopt proactive approaches to create safer and sustainable HVACR systems.

Engaging Discussions and Industry Insights

The seminar provided an excellent platform for HVACR professionals, engineers, consultants, and students to exchange ideas and engage in discussions about the future of refrigerants. The interactive Q&A session allowed attendees to explore practical solutions and strategies for addressing safety risks effectively.

Looking Ahead

This seminar underlines ASHRAE Pakistan Chapter's commitment to fostering knowledge sharing and advancing safety and sustainability within the HVACR industry. Stay tuned for upcoming events and initiatives that aim to drive progress and innovation in the sector. KARACHI: PR

Gentry Beach-led mining company signs landmark deal in Pakistan

White Bridge Mining, led by prominent US investor Gentry Beach, has signed a landmark agreement with the Apex Energy for the exploration and development of Placer Gold deposits.

This agreement marks a major breakthrough in unlocking Pakistan's vast, untapped mineral wealth—estimated at over $50 trillion—and integrating the country into global critical mineral supply chains.

This first-of-its-kind investment demonstrates growing international confidence in Pakistan's mining sector, paving the way for advanced mineral exploration, sustainable extraction, and long-term economic growth. It also highlights White Bridge Mining's commitment to responsible investment, state-of-the-art mining technologies, and high-value job creation. Gentry Beach, a leading investor in strategic resource development, emphasized the significance of this agreement: "Pakistan is home to extraordinary mineral wealth, and our investment is a commitment to unlocking its full potential through responsible mining and global partnerships. This is a transformative opportunity for Pakistan to become a key supplier in the critical minerals sector for the US, while also driving economic growth and technological advancement."

This collaboration has the potential to be positioned within the U.S. Department of Defense's (DoD) Trusted Partner Program, which seeks to secure and diversify critical mineral supply chains in key global markets. As demand for REEs and strategic metals rises, Pakistan's resource potential provides a compelling opportunity to enhance long-term supply resilience and develop a stable, independent mineral economy. By aligning with international initiatives focused on strengthening critical mineral security, this agreement sets the stage for Pakistan to play a greater role in the global mining industry.

Pakistan's rich deposits of placer gold, rare earth elements (REEs), and other high-value minerals present a significant opportunity to diversify global supply chains, reducing dependency on limited sources while strengthening Pakistan's position as a trusted mineral supplier. This agreement is expected to bring modern mining technologies and sustainable extraction practices, ensuring that Pakistan's mineral wealth is developed responsibly while maximizing economic returns. The initiative is also set to create thousands of high-value jobs, establish advanced mineral processing facilities, and integrate Pakistan into strategic trade partnerships with key global markets. -- PR

PSQCA Forms Mechanical National Standards Committee

The Pakistan Standards & Quality Control Authority (PSQCA) has notified the formation of the Mechanical National Standards Committee for a three-year period, effective from January 13, 2025. Engr. Shakeel Ahmed Khan, former Chief of Mechanical and Electrical Services at Karachi Port Trust (KPT), has been appointed as the Chairman of the committee.

The notification from the authority, which operates under the Ministry of Science & Technology (MoST), Government of Pakistan, also mentions Professor Dr. Sajid Hussain Sial, Chairman and Head of the Department of Metallurgy and Materials Engineering at Dawood University of Engineering & Technology (DUET), Karachi as vice chairman.

According to the notification issued by the Director of Standards/Director CA, the National Standards Committee will perform its functions as per Clause 5 of the Pakistan Standards Rules 2008.

The committee comprises 34 members, including:

Dr. M. Rizwan Shaad, UPC Lahore
Syed Aqeel Shah, NUST, Karachi
Dr. Engr. Mehmood Aslam Bhutta, UET Lahore
Dr. Bilal Zahid, NED University, Karachi
Ashfaq Memon, Joint Technical Director, MoST
Engr. Imran Ali, PCSIR Labs, Karachi
Engr. K.B. Ali, CEO, EDB
Ghulam Qasim, DG Technical, Ministry of Railways, Islamabad
Khursheed Mohammad Farooqi, GM, PNSC
Asif Ali Khan, Honorary Secretary, Pakistan Shipbreakers Association
Adil Khan, PSM
Ghulam Ali Badia
Rana Naveed, PSM Melters Association
Abbas Akbar Ali, PALSP
Younus Bajwa, EKAL Surgical Industry
Shaikh Hafiz Bilal, FPCCI
Zulifkar Ali Dhakan, VC, NSC
Kokab Iqbal, Chairman, CAP
Engr. Ayaz Mirza, IEP

The committee also includes some co-opted members. -- ERMD

AGRI TECH

SAU witnesses growing significance of agricultural education among youth

Sindh Agriculture University (SAU) Tandojam is enhancing its efforts to address critical agricultural challenges through targeted, issue-based research. This commitment was reaffirmed by Vice-Chancellor Dr Altaf Ali Siyal during his visit to the Faculty of Animal Husbandry and Veterinary Sciences and the Faculty of Crop Protection.

Dr Siyal stressed the need to tackle the effects of climate change, including crop infestations such as locusts, global warming, and other emerging threats to agriculture. He under-

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How international collaborations can bear fruits in agricultural sector

It is the need of the hour to develop agriculture on modern lines to ensure food security and address the woes of the farming community, said Vice Chancellor University of Agricultural Faisalabad Prof Dr Muhammad Sarwar Khan.

Talking to 42 Mid-Career Management Course at the National Institute of Management Islamabad, Prof Dr Khan said that the university had developed varieties of climate-resilient wheat with the support of Washington State University will prove to be a milestone. He said that the university has introduced high-yielding and potential varieties of Genetically Modified sugarcane including Insect-resistant transgenic sugarcane (CABB-IRS) and Herbicide-tolerant transgenic sugarcane (CABB-HTS).

These sugarcane varieties carry superior traits like input-responsiveness, early maturing, top borer resistance, herbicide tolerance, and a high number of tillers. It is the second GM sugarcane variety after Brazil across the globe.

He said that the UAF had introduced new varieties of soybeans which are being promoted among the farmers to get rid of the import. He said they had developed chickpeas for irrigated land. He was of the view that the brassica variety UAF 11 is also a hallmark step. He said that UAF, being the first agricultural institution in the subcontinent was playing a significant role in the uplift of the sector.

He said that innovation in agriculture can be done only by bringing research to the doorsteps of farmers, for which agricultural scientists and experts will have to play an active role.

Talking about internationalization, he said that the university was housing the Pak Korea Nutrition Center, the Center for Advanced Studies in Agriculture and Food Security, the Chinese Confucius Institute, the D8 Center, and ISTA Seed Lab and it has running 205 Memorandum of Understanding with international organization and 182 with national organization. He said that it has introduced new varieties of quinoa, backyard poultry, and others. -- ERMD

Get ready to welcome 'robotic insects' on agricultural farms

With a more efficient method for artificial pollination, farmers in the future could grow fruits and vegetables inside multi-level warehouses, boosting yields while mitigating some of agriculture's harmful impacts on the environment.

To help make this idea a reality, MIT researchers are developing robotic insects that could someday swarm out of mechanical hives to rapidly perform precise pollination. However, even the best bug-sized robots are no match for natural pollinators like bees when it comes to endurance, speed, and maneuverability.

Now, inspired by the anatomy of these natural pollinators, the researchers have overhauled their design to produce tiny, aerial robots that are far more agile and durable than prior versions. Their research appears in Science Robotics.

The new bots can hover for about 1,000 seconds, which is more than 100 times longer than previously demonstrated. The robotic insect, which weighs less than a paperclip, can fly significantly faster than similar bots while completing acrobatic maneuvers like double aerial flips.

The revamped robot is designed to boost flight precision and agility while minimizing the mechanical stress on its artificial wing flexures, which enables faster maneuvers, increased endurance, and a longer lifespan.

The new design also has enough free space that the robot could carry tiny batteries or sensors, which could enable it to fly on its own outside the lab.

"The amount of flight we demonstrated in this paper is probably longer than the entire amount of flight our field has been able to accumulate with these robotic insects. With the improved lifespan and precision of this robot, we are getting closer to

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SAU witnesses growing significance of agricultural education among youth

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scored the importance of developing climate-resilient farming practices, improved crop varieties, and conservation of indigenous livestock breeds to support farmers and strengthen the agricultural sector.

Dr Siyal further acknowledged the high expectations of the farming community, emphasizing the university's role in delivering pure, high-yield seed varieties, cutting-edge technologies, and effective farmer advisory services. -- ERMD

The VC highlighted the growing significance of agricultural education among the youth, citing its vast potential for employment and entrepreneurship.

He urged faculty members to ensure student participation in classroom sessions, fieldwork, and laboratory activities to prepare them for practical challenges. He also emphasized the need to upgrade teaching and research facilities, pledging full institutional support to overcome any barriers.

Get ready to welcome 'robotic insects' on agricultural farms

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some very exciting applications, like assisted pollination," says Kevin Chen.

Chen, an associate professor in the Department of Electrical Engineering and Computer Science (EECS), head of the Soft and Micro Robotics Laboratory within the Research Laboratory of Electronics (RLE), and the senior author of an open-access paper on the new design, is joined on the paper by co-lead authors Suhan Kim and Yi-Hsuan Hsiao, who are EECS graduate students; as well as EECS graduate student Zhijian Ren and summer visiting student Jiashu Huang.

Boosting performance

Prior versions of the robotic insect were composed of four identical units, each with two wings, combined into a rectangular device about the size of a microcassette.

"But there is no insect that has eight wings. In our old design, the performance of each individual unit was always better than the assembled robot," Chen says.

This performance drop was partly caused by the arrangement of the wings, which would blow air into each other when flapping, reducing the lift forces they could generate.

The new design chops the robot in half. Each of the four identical units now has one flapping wing pointing away from the robot's center, stabilizing the wings and boosting their lift forces. With half as many wings, this design also frees up space so the robot could carry electronics.

In addition, the researchers created more complex transmissions that connect the wings to the actuators, or artificial muscles, that flap them. These durable transmissions, which required the design of longer wing hinges, reduce the mechanical strain that limited the endurance of past versions.

"Compared to the old robot, we can now generate control torque three times larger than before, which is why we can do very sophisticated and very accurate path-finding flights," Chen says.

Yet even with these design innovations, there is still a gap between the best robotic insects and the real thing. For instance, a bee has only two wings, yet it can perform rapid and highly controlled motions.

"The wings of bees are finely controlled by a very sophisticated set of muscles. That level of fine-tuning is something that truly intrigues us, but we have not yet been able to replicate," he says.

Less strain, more force

The motion of the robot's wings is driven by artificial muscles. These tiny, soft actuators are made from layers of elastomer sandwiched between two very thin carbon nanotube electrodes and then rolled into a squishy cylinder. The actuators rapidly compress and elongate, generating mechanical force that flaps the wings.

In previous designs, when the actuator's movements reach the extremely high frequencies needed for flight, the devices often start buckling. That reduces the power and efficiency of the robot. The new transmissions inhibit this bending-buckling motion, which reduces the strain on the artificial muscles and enables them to apply more force to flap the wings.

Another new design involves a long wing hinge that reduces torsional stress experienced during the flapping-wing motion. Fabricating the hinge, which is about 2 centimeters long but just 200 microns in diameter, was among their greatest challenges.

"If you have even a tiny alignment issue during the fabrication process, the wing hinge will be slanted instead of rectangular, which affects the wing kinematics," Chen says.

After many attempts, the researchers perfected a multistep laser-cutting process that enabled them to precisely fabricate each wing hinge.

With all four units in place, the new robotic insect can hover for more than 1,000 seconds, which equates to almost 17 minutes, without showing any degradation of flight precision.

"When my student Nemo was performing that flight, he said it was the slowest 1,000 seconds he had spent in his entire life. The experiment was extremely nerve-racking," Chen says.

The new robot also reached an average speed of 35 centimeters per second, the fastest flight researchers have reported, while performing body rolls and double flips. It can even precisely track a trajectory that spells M-I-T.

"At the end of the day, we've shown flight that is 100 times longer than anyone else in the field has been able to do, so this is an extremely exciting result," he says.

From here, Chen and his students want to see how far they can push this new design, with the goal of achieving flight for longer than 10,000 seconds.

They also want to improve the precision of the robots so they could land and take off from the center of a flower. In the long run, the researchers hope to install tiny batteries and sensors onto the aerial robots so they could fly and navigate outside the lab.

"This new robot platform is a major result from our group and leads to many exciting directions. For example, incorporating sensors, batteries, and computing capabilities on this robot will be a central focus in the next three to five years," Chen says. -- ERMD

Green Data Centers: Protocols for Energy Efficiency and Waste Reduction

Engr. Dr. Muhammad Nawaz Iqbal

With the increase in the intensity of the digital economy, the demand for green data centers is becoming a substantial solution to environmental problems. The facilities that will be established will seek to achieve the goals and objectives of conserving energy and minimizing wastes being churned out into the environment, in doing this the facility will seek to put into practice sustainable measures even as it proactively works around achieving optimal operational efficiency. This paper aims to demonstrate that through the use of superior technologies and such strict processes, these green data centers are not only beneficial from the environment but also from an economic perspective, for businesses. The shift from basic data centers to environmentally more sustainable ones is crucial because demands for electricity and electronics are constantly increasing.

Energy-efficient hardware is therefore among the most important facets of green data centers. Efficient server hardware and storage, switches, and routers have a better value of power efficiency while offering the right level of performance. This indicates an improved thermal efficiency of modern processors, and the availability of far more efficient cooling mechanisms helps to lessen the overall energy load. Also, knowledge, possessed by authorized people makes it possible for several virtual machines to run on just one physical server thus reducing the power consumption of hardware and duplication of it.

The cooling of the data center is an area of acute interest in green data center designs since cooling systems consume nearly forty percent of the power used by the data center. Modern approaches to cooling are now replacing conventional cooling techniques like liquid cooling, air-side economization, and immersion cooling. Some examples of direct cooling include liquid cooling, in which water or other types of fluids used to cool the components are different from air cooling methods. Air-side cool recovery on the other hand means the use of outside air for cooling instead of mechanical chillers. These techniques ensure that the operating temperatures are sustained and energy consumption is kept to a minimum.

Another important concept of green data centers is the integration of renewable energy. Most facilities are now utilizing solar, wind, or hydroelectric power to eliminate or reduce their emissions of greenhouse gases. Internet giants such as Google and Amazon have taken significant first steps toward investing capital in renewable energy to fuel their data halls. Battery storage systems used together with on-site renewable energy systems provide the necessary power supply while reducing fossil fuels. Also, subscribing to renewable energy credit programs enhances the resolution towards sustainability.

While data centers produce a lot of heat, green data centers are finding ways to use this waste heat in useful processes. Waste heat can be utilized again to heat offices or other structures, households or even neighborhoods. It not only cuts the wasted energy but also yields other benefits from the energy we have used. It has become possible to incorporate waste heat recovery systems into the urban planning, making data centers to be very significant to other environments.

Good data management and storage also help in the conservation of energy as is made clear below. Energy-proportional storage, where frequently accessed data is potentially kept on faster, more energy-efficient devices, and the less frequently accessed data is on slower, lower energy devices, is efficient. Furthermore, the data reduplications and compression which are accomplished through powerful algorithms intend much lesser storage and hence much smaller hardware and energy demands. The efficiency of data management is therefore increased from automation and the use of artificial intelligence in solutions.

Another key challenge facing data centers is e-waste management and green facilities addressing and composting to recycle. End-of-life servers, PCs, or other related hardware are reused, redeployed or recycled rather than disposed on the landfills. It can involve working with certified e-waste recycling firms to make sure compliance with the legal requirements of dealing with these materials while at the same time to reuse items like copper, gold and aluminum. Others have also embraced leasing models for the equipment so that they can be updated frequently with minimal disposal.

Energy monitoring and reporting must therefore form part of the green data centers. Sophisticated EMS facilitates monitoring and controlling the utility consumption efficiency or PUE and other parameters in real-time. Essential infrastructure of data centers these systems not only reduce energy usage but also ensure high operation performance from their infrastructure. Additionally, the periodic energy audits enhance the exercise by identifying further measures to be taken to enhance energy efficiency. Green aspects are also important in the design and architecture of data centers. Modular data centers are scalable and efficient which means they can add capacity when they need to, which also means they do not waste money and resources. In housing design, especially in relation to the orientation of the building, the use of insulation and reflective materials on the roof has led to reduced cooling needs. Using such things as green roofs and rainwater harvesting systems improves sustainability and the health of the environment.

Introducing automatic and the use of artificial intelligence in running the green data centers has brought about change. Machines learn the average energy requirement and control system distribution based on specific patterns determined in advance. AI-driven predictive service ensure that the equipment is barely down and there are no energy-intensive repair works. Furthermore, it examines data center operations to learn about patterns that cause inefficiency and take action to ensure energy conservation.

The green protocols reinforcement has been boosted by collaboration between companies, governments, and the industries' standards organizations. Measures, for example, energy consumption limits and bonuses for using green energy drive organizations to make decisions toward sustainability. Such programs like LEED (Leadership in Energy and Environmental Design), and Energy Star serves as guidelines to push the data center into performing better and meet up to this accreditation.

The growth of the digital marketplace will quickly spur much demand for more environmentally friendly data centers. Today's green data center is at the forefront of responsible IT and investing in innovative, safe, and sustainable technology and processes. Such endeavors are not only directed at solving important ecological issues but also contribute to achieving the goals of the companies interested in economies of scale and reduction of adverse social and environmental impacts. The implementation of sustainability strategies into the heart of the data center is a revolution recognized as a revolution towards a green economy.■

فرمانِ قائداعظمؒ

ایمان ، اتحاد ، تنظیم

آزادی اور قربانی

پس جہاں تک ممکن ہو ہمیں اپنے حریفوں کو سمجھانے کے لئے عقل اور دلیل سے کام لینا چاہیے۔ میں جانتا ہوں کہ دلیل اور عقل ہمیشہ ہی کامیاب نہیں ہوتیں لیکن ہمیں اپنی طرف سے پوری کوششیں کرنی چاہیئے۔ جو لوگ فی الحال لاہور کی قرارداد پاکستان کے خلاف ہیں، ہمیں ان کے دل میں غیر ضروری تلخی پیدا نہیں کرنی چاہیے۔ آخر ہمیں ضرورت ہی کیا ہے؟ مجھے پورا پورا یقین ہے کہ ہمارے یہی حریف ایک نہ ایک دن محسوس کر لیں گے کہ ہندوستان کے انتہائی پیچیدہ مسئلے کا واحد اور بہترین حل قیام پاکستان ہے کہ جس کے قیام کی نظیر پوری دنیا کی تاریخ میں نہیں ملتی۔

(پنجاب مسلم سٹوڈنٹس فیڈریشن۔2 مارچ 1941ء)

آوازِ اقبال

اقبال کا ترانہ بانگ درا ہے گویا
ہوتا ہے جادہ پیما پھر کارواں ہمارا

آہ! یہ دست جو اے گل رنگیں نہیں
تو شناسائے خراش عقدۂ مشکل نہیں

کس طرح تجھ کو یہ سمجھاؤں کہ میں گل چیں نہیں
اے گل رنگیں ترے پہلو میں شاید دل نہیں

کام مجھ کو دیدۂ حکمت کے الجھیڑوں سے کیا
زیب محفل ہے شریک شورش محفل نہیں

دیدۂ بلبل سے میں کرتا ہوں نظارہ تر
یہ فراغت بزم ہستی میں مجھے حاصل نہیں

اس چمن میں، میں سراپا سوز و ساز آرزو
اور تیری زندگانی بے گداز آرزو

توڑ لینا شاخ سے تجھ کو مرا آئیں نہیں
یہ نظر غیر از نگاہ چشم صورت میں نہیں

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گوادر ایئرپورٹ: اہم سنگ میل

سی پیک کوریڈور کا اہم منصوبہ اور پاک چین دوستی کی اعلیٰ مثال نیو گوادر انٹرنیشنل ایئرپورٹ جس کا 14 اکتوبر 2024 کو چینی وزیراعظم لی چیانگ کے دورہ پاکستان کے دوران وزیراعظم شہباز شریف اور ان کے چینی ہم منصب نے علامتی افتتاح کیا تھا، مکمل طور پر فعال ہوگیا ہے۔ پی آئی اے کی پہلی پرواز پی کے 503 کراچی سے 46 مسافروں کو لے کر کمرشل پرواز کی حیثیت سے لینڈ ہوئی جسے واٹر سیلوٹ کیا گیا۔ وزیراعظم شہباز شریف نے گوادر ایئرپورٹ سے پروازوں کا سلسلہ شروع ہونے پر اظہار اطمینان کیا ہے۔ ان کا کہنا تھا کہ یہ مواصلاتی روابط کے فروغ کی طرف ایک اہم قدم ہے جس سے خطے اور پاکستان کی ترقی کا خواب شرمندہ تعبیر ہوگا۔ گوادر انٹرنیشنل ایئرپورٹ کی فعالیت پاکستان کی ہوابازی کی تاریخ میں اہم سنگ میل، علاقائی رابطوں کے نئے دور کا آغاز اور لامحدود مواقع کا ایک دروازہ ہے جس سے تجارت اور سیاحت کی نئی راہیں کھلیں گی۔ مشرق وسطیٰ، خلیجی ممالک، ایشیا چین اور دیگر سے رابطے جڑیں گے۔ بڑی عالمی منڈیوں تک اضافی رسائی ہوگی۔ سمندری خوراک، معدنیات اور دیگر برآمدات میں سہولتیں اور سرمایہ کاری میں اضافہ ہوگا۔ یہ رقبے کے لحاظ سے پاکستان کا سب سے بڑا ایئرپورٹ ہے جو 4300 ایکڑ پر گوادر شہر سے 26 کلومیٹر دور گورنڈانی کے مقام پر قائم کیا گیا ہے۔ پروجیکٹ کی سالانہ گنجائش چار لاکھ مسافروں کی ہے۔ رن وے 3658 میٹر طویل اور 75 میٹر چوڑا ہے جس پر ایئربس 380 اور بوئنگ 747 جیسے بڑے طیارے بھی لینڈ کرسکیں گے۔ اس منصوبے پر 55 ارب روپے لاگت آئی ہے جس میں چین اور عمان کی گرانٹ بھی شامل ہے۔ یہ منفرد منصوبہ پاکستانی اور چینی ٹیموں کی بے پناہ کوششوں اور لگن کا ایک قابل ذکر کارنامہ ہے جس پر پوری قوم کو فخر ہے اور اس سے ہماری ترقی اور خوشحالی کا نیا باب رقم ہوگا۔■

Sales Blog for Young Engineers and Entrepreneurs

Pakistan - A Land of Opportunity

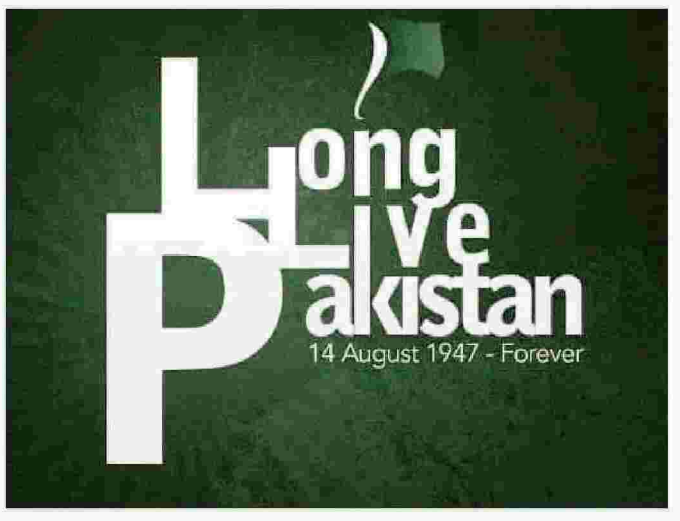
Muhammad Tariq Haq | ESL

This is the typical story of many successful businesses in Pakistan, including the journeys of the Mians, Manshas, Dawoods, Tabanis, Lakhanis, Bilwanis, Agha Khanis, Bohris, Tabba's, House of Habibs and leaders in textiles and denim! Almost all of them started humble. Through patience, hard work, integrity, humility, prayers and commitment to communities, they turned their dreams into reality. They believed in Pakistan as a land of opportunity, standing strong through challenges and celebrating small wins, proving that they could achieve greatness without leaving the country and succumbing to brain drain!

In the lively heart of Karachi, a small shop opened in 1980. Owned by Mian Sahib's father, this modest venture was filled with dreams and hard work. Little did anyone know that it would grow into a successful empire built on humility and vision.

As time went on, Mian Sahib's sons joined the family business, each bringing their own strengths. By 1989, they turned the shop into a thriving factory, beginning to export products and starting a new chapter. Their teamwork and shared goals pushed the business forward, and they eventually bought out their father's shares, allowing him to enjoy life with his wife.

Under the brothers' leadership, the business grew into a large group known for its quality and integrity. Despite their success, they stayed humble, understanding that true achievement is about the positive impact they have on their community, not just about wealth.



When discussing Pakistan's economy, the brothers showed strong confidence in their country. "We built our fortune here, and there's still so much work to do". They announced plans for a new factory in Lahore, set to create thousands of jobs, while also expanding their Karachi operations.

The Mian family was known for their discipline and punctuality, arriving at work by 9 AM and leaving at 5 PM. But when needed, they worked from 5 in the morning until 9 at night. Their commitment to routine showed their values of respect and integrity, creating a positive environment where employees felt valued and motivated.

Amidst economic challenges, the Mian Sahibs stayed optimistic. They believed that success without humility would perish. Their story reminds us that true success is about nurturing values without pomp and pageantry.

Just yesterday, I spoke with my twin brother, who recently retired as a top oncologist in Canada. He mentioned that his classmates from Dow College who stayed in Pakistan after graduation in the early '80s are doing better than those who moved to North America. He also noted that Muslims from Pakistan have thrived more than those who stayed in India after partition. He further commented that despite a population ratio of more than 1:5 between Pakistan and India, doctors from Pakistan are one against three from India. Despite, Muslims being in a ratio of 1:5 in India, Muslim doctors are very sadly not more than 2% of all Indian doctors in the first world! This shows that Pakistan is indeed a land of opportunity, though we overlook it.

Let's take inspiration from the business successes in Pakistan. With humility, patience and prayers, we can create a brighter future HERE. Long live PAKISTAN!■

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گندہ پانی سمندر میں ڈالنے کا عمل جاری

سیوریج منصوبہ ایس تھری 18 سال سے تاخیر کا شکار

منصوبہ 29 ارب روپے میں مکمل کیا جائیگا، میئر کی ہدایت پر کام تیزی سے جاری ہے، ٹریٹمنٹ پلانٹس اصل ڈیزائن اور استطاعت کے مطابق مکمل کیے جائینگے، پروجیکٹ ڈائریکٹر

وفاقی حکومت نے ساڑھے 3 ارب جاری کیے تھے، مزید فنڈز دینے سے انکار، سندھ حکومت اس منصوبے کی تکمیل کی ذمے دار، ٹریٹمنٹ پلانٹ ون اور تھری ابھی تک مکمل نہیں کیے

سیوریج کا میگا منصوبہ ایس تھری 18 سال سے تاخیر کا شکار ہے، وفاقی حکومت نے اس منصوبے سے ہاتھ اٹھا دیا ہے اور فنڈز دینے سے انکار کر دیا، اب سندھ حکومت اس منصوبے کی تکمیل کی ذمے دار ہے، فیرون کے تحت لیاری ندی میں پائپ لائن کی تنصیب کا کام تقریباً مکمل کر لیا گیا ہے تاہم ٹریٹمنٹ پلانٹ ون TP۔اور ٹریٹمنٹ پلانٹ تھری TPIII بھی تک مکمل نہیں کیے جا سکے ہیں۔ فیز ٹو ملیر ندی اور ٹریٹمنٹ پلانٹ IV پر ابھی تک کام شروع نہیں کیا جا سکا ہے اور اسے ایس تھری منصوبے سے خارج کر دیا گیا ہے۔ اسوقت سمندر میں صرف 35 ملین گیلن ڈیلی (ایم جی ڈی) ٹریٹمنٹ کر کے ڈالا جا رہا ہے بقیہ 425 ملین گیلن سیوریج کا پانی روزانہ بغیر ٹریٹمنٹ کے سمندر میں ڈالا جا رہا ہے جس کی وجہ سے سمندری حیاتیات کو شدید خطرات لاحق ہیں۔

تفصیلات کے مطابق ایس تھری منصوبہ کی ڈیزائننگ کا کام 2007 میں شروع کیا گیا لیکن حتمی منظوری 2013 میں ہوئی جبکہ تعمیراتی کام 2014 میں شروع ہوا، منصوبے کی تکمیل کی مدت دو سال رکھی گئی، منصوبے کی اوریجنل پی سی ون 7.9 ارب تھی جسے سندھ حکومت اور وفاقی حکومت نے مساوی 50 فیصد ادا کرنا تھا ایس تھری منصوبہ کی لاگت میں اضافے کے باعث وفاقی وصوبائی حکومتوں کے درمیان تنازع اور کرونا وائرس کے باعث تعمیراتی کام چار سال تقریباً مکمل طور پر بند رہا، کراچی واٹر اینڈ سیوریج کارپوریشن ایک آفیسر نے نام ظاہر نہ کرنے کی شرط پر بتایا کہ ایس تھری منصوبہ کے ذریعے 460 ملین گیلن یومیہ گھریلو سیوریج کو صاف کر کے سمندر برد کیا جاتا ہے، پہلے اس پر لاگت کا تخمینہ 7.9 ارب روپے تھا، بعد ازاں کئی اجزا شامل ہونے اور دیگر وجوہات کے باعث اس کی نظر ثانی شدہ لاگت 36 ارب ہوگئی۔

وفاقی حکومت نے منصوبے کی لاگت میں کئی گنا اضافے پر شدید اعتراضات کیے اور بہت ہی لیت ولعل کے بعد 2023 میں نظر ثانی شدہ پی سی ون منظور کی۔ اس دوران کرونا وائرس بھی آ گیا۔ فنڈز کی کمی اور کورونا وائرس کے باعث یہ منصوبہ 2019 تا 2023 تقریباً بند رہا۔ چند کمپونٹ پر انتہائی سست روی سے کام ہوا، متعلقہ آفیسر کے مطابق 2008 میں واٹر کارپوریشن کے تینوں ٹریٹمنٹ پلانٹس TPI، TPII اور TPIII ناکارہ ہو چکے تھے، اس کے بعد سے 460 ملین گیلن ڈیلی سیوریج بغیر ٹریٹمنٹ کیسے سمندر برد کیا جا رہا تھا۔ محمود آباد میں واقع ٹریٹمنٹ پلانٹ ٹو TPII کے اطراف کی زمین پر رہائشی گھر تعمیر ہونے اور تجاوزات کے باعث یہ ٹریٹمنٹ پلانٹ منصوبے سے خارج کر دیا گیا۔ متعلقہ آفیسر کے مطابق سپریم کورٹ کی ہدایت پر کراچی واٹر اینڈ سیوریج کارپوریشن نے 2018 میں ماڑی پور پر واقع ٹریٹمنٹ پلانٹ تھری TP III کو جزوی آپریشنل کر دیا تھا۔ اس منصوبے کا افتتاح سپریم کورٹ آف پاکستان کے سابق چیف جسٹس ثاقب نثار نے 22 جولائی 2018ء کو کیا تھا، ٹی پی تھری کی پرانی مشینری کی بحالی اور کچھ نئی مشینوں کی تنصیب سے 54 ملین گیلن یومیہ سیوریج ٹریٹمنٹ کر کے سمندر میں پھینکا جا رہا تھا۔

اسوقت پرانی پائپ لائن میں سلٹ Silt آجانے کے باعث صرف 35 ملین گیلن ڈیلی ٹریٹمنٹ کر کے سمندر برد کیا جا رہا ہے۔ متعلقہ آفیسر کے مطابق وفاقی حکومت کے ادارے ایکنیک نے نظر ثانی شدہ پی سی ون 36 ارب کی منظور کر لی ہے لیکن اس شرط کے ساتھ کہ وفاقی حکومت اور بیجنل پی سی ون کے مطابق اپنا شیئر ادا کرے گی، نظر ثانی پی سی ون کے اضافی فنڈز کی زمہ دار سندھ حکومت ہوگی۔ متعلقہ افیسر نے بتایا کہ وفاقی حکومت نے اور بیجنل پی سی ون کے مطابق اپنا پورا شیئر ادا کر دیا ہے، پروجیکٹ ڈائریکٹر ایس تھری نظام الدین شیخ کا کہنا ہے کہ وفاقی حکومت نے ایس تھری منصوبہ کے لیے ساڑھے 3 ارب جاری کیے، اب وفاقی حکومت نے ایس تھری منصوبے کے لیے فنڈز دینے سے انکار کر دیا ہے اور سندھ حکومت اس منصوبے کے تمام اخراجات برداشت کرے گی، ایس تھری منصوبے سے فیز ٹو ملیر ندی میں ٹرنک سیوریج اور ٹریٹمنٹ پلانٹ فور کو حذف کر دیا، ایس تھری منصوبے سے فیز ٹو (ملیر ندی میں ٹرنک سیوریج کی تنصیب اور ٹی پی فور) کے نکالے جانے کے بعد منصوبے کی لاگت کم ہوگئی ہے، اب منصوبہ 29 ارب روپے میں مکمل کیا جائے گا، فیز ون لیاری ندی میں سرجانی سے لیکر ماڑی پور تک 33 کلومیٹر پائپ لائن کا کام تقریباً (ٹرنک سیوریج) مکمل کیا جا چکا ہے، ٹریٹمنٹ پلانٹ ون (ٹی پی ون) ہارون آباد میں سول اور کس 60 فیصد، الیکٹریکل اور میکینکل ورک 23 فیصد اور ٹریٹمنٹ پلانٹ تھری (ٹی پی تھری) میں سول ورک 75 فیصد۔ الیکٹرکل و میکینیکل ورک 25 فیصد مکمل ہو چکا ہے، دونوں ٹریٹمنٹ پلانٹس پر کام چل رہا ہے اور پورا منصوبہ جون 2026 تک مکمل کر لیا جائے گا۔

انھوں نے کہا کہ ماضی میں فنڈز کی کمی اور کورونا وائرس کی وجہ سے منصوبے پر ترقیاتی کام 4 سال بند رہا لیکن اب میئر کراچی اور کراچی واٹر اینڈ سیوریج کارپوریشن کے چیئرمین مرتضیٰ وہاب اس منصوبے میں خصوصی دلچسپی لے رہے ہیں، ان کی ہدایت پر کام تیزی سے کیا جا رہا ہے، نظام شیخ نے کہا کہ ایس تھری منصوبے پر 15 ارب روپے خرچ ہو چکے ہیں، رواں سال بجٹ میں 3 ارب روپے مختص کیے گئے ہیں اور متواتر فنڈز جاری ہو رہے ہیں، ایک سوال کے جواب میں انھوں نے کہا کہ نگراں حکومت نے منصوبے میں ترمیم کرتے ٹی پی ون کی استطاعت کم کر کے 100 ایم جی ڈی سے کم کر کے 35 ایم جی ڈی اور ٹی پی تھری کی استطاعت 180 ایم جی ڈی سے کم کر کے 100 ایم جی ڈی کر دی تھی تاہم موجودہ منتخب صوبائی حکومت نے اور بیجنل منصوبے کے تحت ٹی پی ون کی 100 ایم جی ڈی اور ٹی پی تھری کی 180 ایم جی ڈی استطاعت بحال کر دی، اب دونوں ٹریٹمنٹ پلانٹس اپنے اصل ڈیزائن اور استطاعت کے مطابق مکمل کیے جائیں گے، ایس تھری کے پروجیکٹ ڈائریکٹر نے کہا کہ اس وقت ٹی پی تھری جزوی طور پر کام کر رہا ہے، 35 ایم جی ڈی ٹریٹمنٹ کر کے سمندر میں ڈالا جا رہا ہے۔■

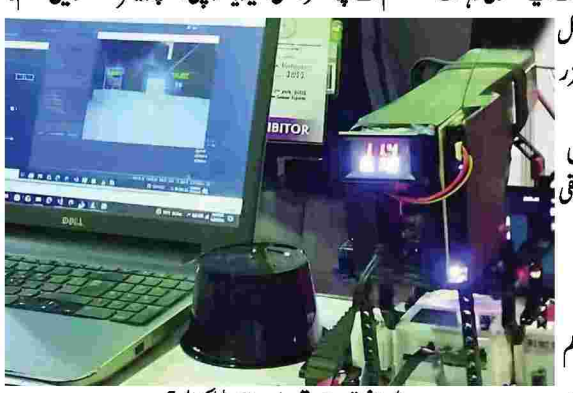
مہران یونیورسٹی کے طلبہ نے روبوٹ ویپن سسٹم تیار کر لیا

سیکیورٹی اہلکاروں اور افواج کا جانی نقصان اور روایتی گولہ بارود کا خرچ کم ہو جائیگا

لیزر شعاؤں کی بیم سے ہدف کو روشنی کی رفتار سے نشانہ بنایا جا سکے گا، طالبعلم اویس

مہران یونیورسٹی آف انجینئرنگ اینڈ ٹیکنالوجی (شہید ذوالفقار علی بھٹو) خیر پور کیمپس کے طلبہ نے پاکستان کی دفاعی خود انحصاری کو مضبوط بنانے کے لیے مصنوعی ذہانت سے چلنے والا روبوٹ وہیکل تیار کر لیا، جس پر نصب لیزر گن سیکنڈوں میں اپنے ہدف کو جلا کر بھسم کرنے کی صلاحیت رکھتی ہے۔ یہ تخلیقی آئیڈیا عملی شکل اختیار کرنے کی صورت میں سیکیورٹی اہلکاروں اور افواج کے جانی نقصان کو کم کرتے ہوئے روایتی گولہ بارود کے خرچ کو کم کرے گا۔

مصنوعی ذہانت کے ذریعے دوست اور دشمن کی شناخت کرتے ہوئے متحرک اور غیر متحرک اہداف کو زمین سے زمین، فضاء سے زمین یا زمین سے فضا میں انتہائی درستگی کے ساتھ نشانہ بنانے کی صلاحیت کا حامل ہوگا، مہران یونیورسٹی کے خیر پور کیمپس کے طلباء کی ٹیم نے اپنا منفرد تخلیقی آئیڈیا کراچی ایکسپو سینٹر میں منعقدہ چوتھے ریسرچ اینڈ ٹیکنالوجی شوکیس میں پیش کیا، جسے وزیر اعلیٰ سندھ نے بھی بے حد سراہا، اس تخلیق کو نیکسٹ جنریشن روبوٹک کومبیٹ سسٹم و دانرجی کا نام دیا گیا ہے مہران یونیورسٹی ڈپارٹمنٹ آف الیکٹرانکس خیر پور کیمپس کے طالب علم سید اویس احمد نے بتایا کہ انھوں نے روبوٹ لیزر گن کا پروٹوٹائپ بنایا ہے جو روایتی بیلسٹک ویپن سسٹم کا بہترین متبادل بن سکتا ہے۔ اس سسٹم کی افادیت یہ ہے کہ اس میں گولا بارود استعمال نہیں ہوگا بلکہ لیزر شعاؤں کی بیم سے ہدف کو روشنی کی رفتار سے نشانہ بنایا جا سکے گا،



سید اویس احمد نے بتایا کہ پروٹوٹائپ کیمرا سینسرز اور آئی آر (ریڈار) سینسرز پر مشتمل ہے اور مختلف قسم کے لینسز استعمال کیے گئے ہیں، اس وقت اس کی رینج چھ فٹ ہے، جسے بہتر اور بڑے ماڈیولر استعمال کر کے اس حد تک بڑھایا جا سکتا ہے کہ فضائی حملے کے دوران دشمن کے میزائلوں کو بھی فضاء میں ہی لیزر شعاعوں سے ناکارہ کیا جا سکتا ہے۔■

'Yes, you're being watched on the internet'

When you go shopping or visit the doctor, your smartphone tracks your journey there. It also tracks what we like and share on Facebook and Instagram; what we listen to on Spotify or watch on YouTube; our credit card transactions.

"All of those things create a data trail," said Duke's Jolynn Dellinger, who teaches classes on privacy law and ethics and technology at the Law School and Duke Science and Society.

In Dellinger's course, "Privacy in a Post-Dobbs World: Sex, Contraception, Abortion and Surveillance," students consider all the traces that people of reproductive age leave online on a daily basis, and how those could potentially be used against them.

Every moment of the day, almost every website, app and device we use is collecting our data: where we go, who we talk to, what we look for on the internet, what we buy.

For people seeking abortions and also for their partners, it's not hard to imagine how these digital footprints could suddenly become dangerous.

An Instagram search for "abortion pills," a log of symptoms in a period tracking app, geolocation data, even a Facebook message to a friend or family member—all of that could be turned over to law enforcement, and with little protection from the Fourth Amendment right against unreasonable searches and seizures, Dellinger explained in a recent piece co-authored with Stephanie Pell of the Brookings Institution.

"In some respects, history is repeating itself," Dellinger and Pell wrote in a 2024 paper, "Bodies of evidence: The criminalization of abortion and surveillance of women in a post-Dobbs world."

Indeed, since the Dobbs decision, nearly two dozen states have banned or limited access to abortion.

"It's true we've been here before," Dellinger said in a recent interview with Duke Today. "But we're not just going back to something reminiscent of the pre-Roe era."

That's because so much of our day-to-day life now leaves a digital footprint, she explained.

But it's not just people seeking abortions who have reason to be concerned.

Research shows that the data trails we leave on our smart phones or social media can be used to infer everything from our political and religious beliefs to our medical conditions and sexual orientation.

In one study led by the University of Cambridge, researchers were able use Facebook likes to predict people's personalities more accurately than their own spouses could.

The data that our devices collect can also be sent to data brokers who may sell it without our knowledge to insurance companies, advertisers and other third parties.

In a study led by Justin Sherman of Duke's Sanford School of Public Policy, researchers identified more than 500 data broker websites selling information about U.S. military personnel, including their marital status, home addresses, net worth and credit rating, even their interests in gambling and the number and ages of their children.

The researchers were able to buy information about tens of thousands of servicemembers with little to no vetting, often for as little as 12 cents per person, raising concerns that foreign adversaries could easily get their hands on such data and use it to blackmail or target servicemembers.

Another study by Duke student Joanne Kim found that Americans' sensitive mental health conditions—ranging from depression and anxiety to PTSD, obsessive-compulsive disorder, and personality disorders—are also on the market.

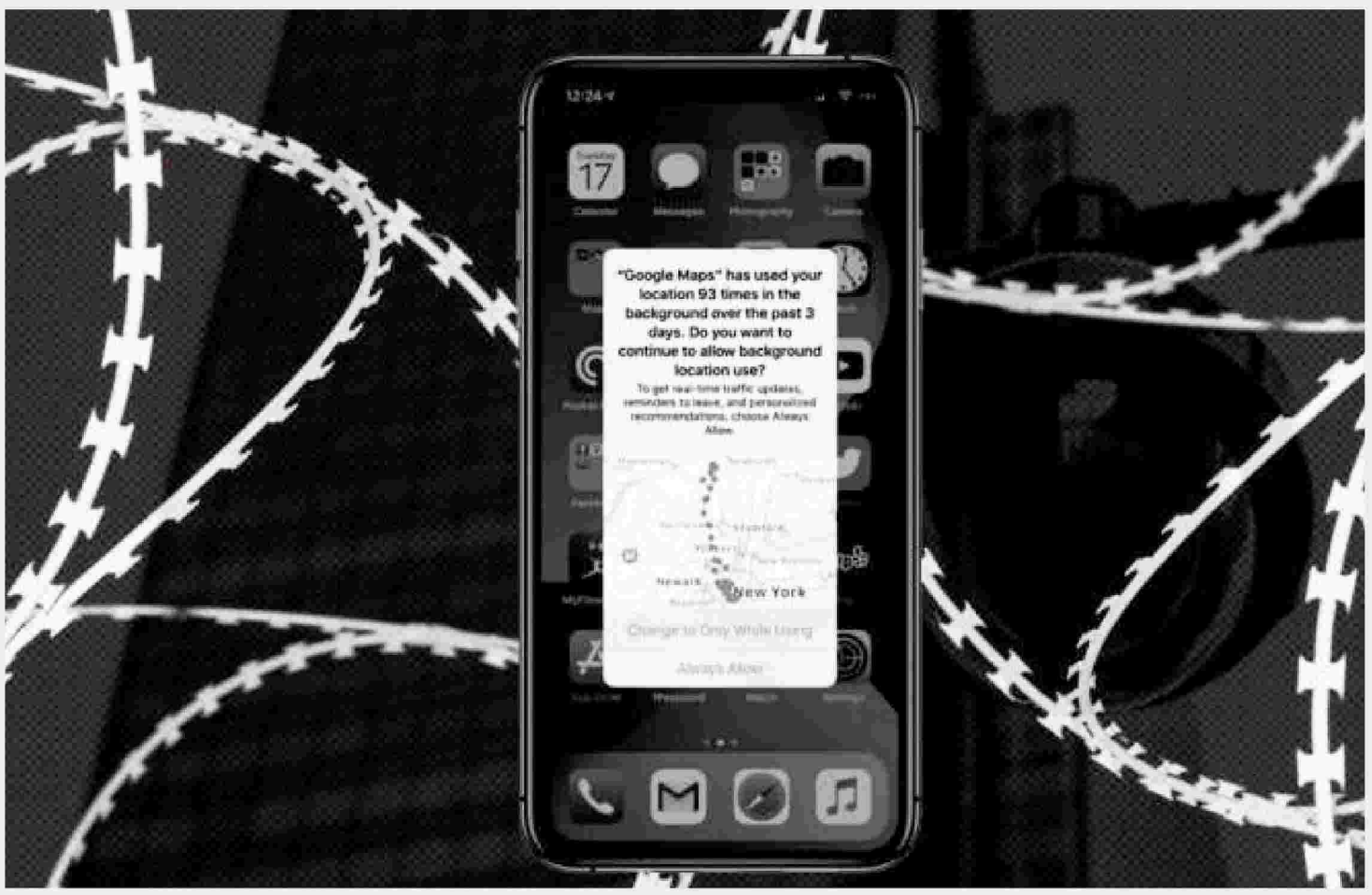
Health data for sale

In her classes, Dellinger said students are often surprised to learn that the U.S. has no federal comprehensive privacy law regulating how our personal data can be collected, shared, used and stored.

We do have laws that cover certain types of data, like HIPAA for health data, or that cover data related to certain populations, like FERPA for student data. But unlike places such as the European Union, "we don't have a comprehensive privacy law for the country," Dellinger said.

"Many people also think 'oh, if it's health information, it's going to be protected,'" Dellinger said. "That's totally understandable. But it's really, really wrong."

Let's say you use WebMD to search symptoms or go to YouTube or ChatGPT for health advice. Or maybe you use a Fitbit or Apple Watch to monitor your heartrate while you work out, or use an app to track your periods. None of these are covered by HIPAA.



Given these realities, it would seem that no digital data can be perfectly private.

"I do agree that it is very, very difficult for folks to completely maintain their privacy," said Nick Tripp, Interim Chief Information Security Officer at Duke.

"There's always the option of opting out," and forgoing things like social media, wearables, and smart gadgets altogether, he added.

"But I don't expect that most people are going to want to do that," Tripp said.

However, Tripp said there are things people can do to make their online activities more private.

The Digital Defense Personal Security Guide, for example, offers a checklist of tips to reduce tracking and data collection while browsing the web, using social media, installing apps and other situations.

"But to some extent, if you participate, you are effectively agreeing to give up some of your privacy," Tripp said.

The burden is on the consumer

Both Tripp and Dellinger agree that most people are unlikely to spend hours tweaking the default settings of every service they use.

"The way our current privacy protection is in the United States, it puts the burden on the consumer to protect themselves," Dellinger said. "This is a political question that demands a political answer."

It's a view that has bipartisan support.

In the post-Roe era, this information environment has had chilling effects on women's reproductive health, said Dr. Beverly Gray, MD, associate professor of obstetrics and gynecology at Duke.

Those effects were echoed in an oral history project led by Drs. Gray and Jonas Swartz in collaboration with Duke oral historian Wesley Hogan, a research professor in history and the John Hope Franklin Humanities Institute.

In 65 interviews their Bass Connections team conducted with providers in 17 states and the District of Columbia, a picture emerged of reproductive health care in upheaval.

Some doctors described delays in life-saving care for common pregnancy complications, or doubts about their future practicing in states with abortion bans for fear of legal repercussions.

Others expressed concerns that a lack of abortion training could leave new physicians inadequately prepared to manage miscarriages or treat emergencies such as ectopic pregnancies.

Still others worried that as new physicians across specialties start to avoid states with abortion bans for their training, the talent drain could exacerbate provider shortages in rural and underserved areas.

"I think when people really appreciate the extent of the consequences of state laws criminalizing abortion in the wake of Dobbs, it makes them very concerned about their future choices," Dellinger said. "What jobs they can take, and where they can live safely and have access to health care in their reproductive years."

"It's a perfect storm of privacy problems," she said. "Twenty-first century surveillance puts this in an entirely different ballpark." -- TX

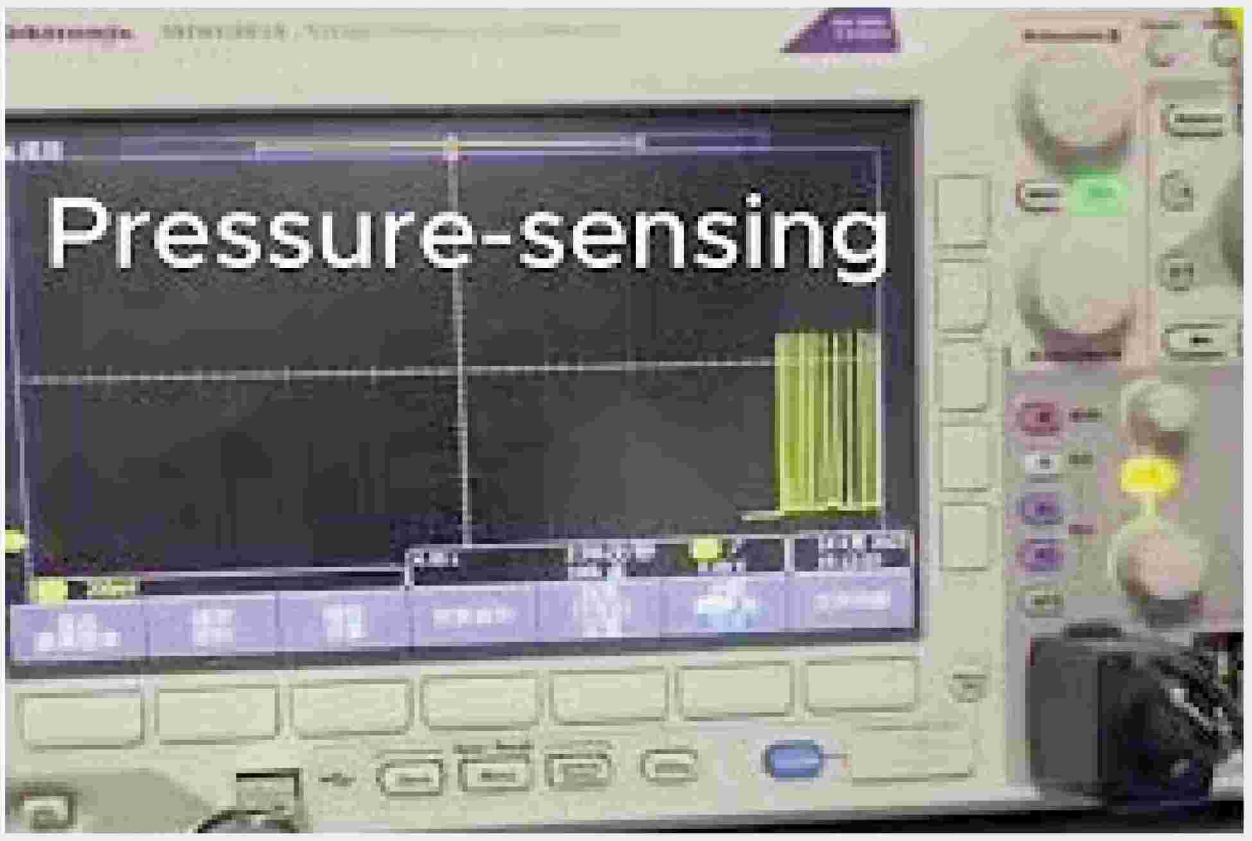
Synthetic neurons that mimic human processes could lead to smarter robotics

Artificially engineered biological processes, such as perception systems, remain an elusive target for organic electronics experts due to the reliance of human senses on an adaptive network of sensory neurons, which communicate by firing in response to environmental stimuli.

A new collaboration between Northwestern University and Georgia Tech has unlocked new potential for the field by creating a novel high-performance organic electrochemical neuron (OECN) that responds within the frequency range of human neurons. The team also built a complete perception system by designing other organic materials and integrating their engineered neurons with artificial touch receptors and synapses, which enabled real-time tactile signal sensing and processing.

The research, described in a paper in Proceedings of the National Academy of Sciences, could move the needle on intelligent robots and other systems currently stymied by sensing systems that are less powerful than those of a human.

"The study highlights significant progress in organic electronics and their application in bridging the gap between biology and technology," said first author Yao Yao, a Northwestern engineering professor. "We created an efficient artificial neuron with reduced footprint and outstanding neuronal characteristics. Leveraging this capability, we developed a complete tactile neuromorphic perception system to mimic real biological processes."



According to corresponding author Tobin J. Marks, Northwestern's Charles E. and Emma H. Morrison Professor of Chemistry in the Weinberg College of Arts and Sciences, existing artificial neural circuits tend to fire within a narrow frequency range.

"The synthetic neuron in this study achieves unprecedented performance in firing frequency modulation, offering a range 50 times broader than existing organic electrochemical neural circuits," Marks said. "In contrast, our device's outstanding neuronal characteristics establish it as an advanced achievement in organic electrochemical neurons."

Marks is a researcher in the fields of organometallic chemistry, chemical catalysis, materials science, organic electronics, photovoltaics and nanotechnology. He is also a professor of Materials Science and Engineering and Professor of Chemical and Biological Engineering in Northwestern's McCormick School of Engineering and as Professor of Applied Physics. His co-corresponding author Antonio Facchetti, a professor at Georgia Tech's School of Materials Science and Engineering, also serves as an adjunct professor of chemistry at Northwestern.

"This study presents the first complete neuromorphic tactile perception system based on artificial neurons, which integrates artificial tactile receptors and artificial synapses," said Facchetti. "It demonstrates the ability to encode tactile stimuli into spiking neuronal signals in real time and further translate them into post-synaptic responses."

The team spanned departments and schools, with researchers who specialized in organic synthesis creating advanced materials that electronic device researchers then incorporated into circuit design and fabrication, and system integration.

With the human brain's immense network of 86 billion neurons poised to fire, sensing systems remain difficult to recreate. Scientists are limited by both the footprint of the design and by the amount they can create. In future models, the team hopes to further reduce the device's size, taking the project a step closer to fully mimicking human sensing systems. -- TP

Optical fiber sensor provides simple, sensitive detection of arsenic in drinking water

Researchers have developed a new optical sensor that provides a simple way to achieve real-time detection of extremely low levels of arsenic in water.

The technology could enable household testing for arsenic, empowering individuals to monitor their own water quality.

Arsenic contamination is a serious environmental and public health challenge affecting millions of people around the world. This contamination occurs when natural geological processes release arsenic from rocks and soil into groundwater and can be exacerbated by mining, industrial waste disposal and use of arsenic-based pesticides.

"Consuming arsenic-contaminated water can lead to severe health conditions including arsenic poisoning and cancers of the skin, lung, kidney and bladder," said lead researcher Sunil Khijwania from the Indian Institute of Technology Guwahati. "By creating a sensor that is sensitive, selective, reusable and cost-effective, we aim to address the need for a reliable and user-friendly tool for routine monitoring, helping to protect communities from the risks of arsenic exposure."

In the journal Applied Optics, the researchers describe their new sensor, which uses an optical fiber and an optical phenomenon known as localized surface plasmon resonance. They used it to detect arsenic levels as low as 0.09 parts per billion (ppb), 111 times lower than the maximum permissible limit of 10 ppb established by the World Health Organization. The sensor also exhibited reliable performance when tested on real drinking water samples from diverse locations and conditions.

"The highly sensitive sensor provides analysis within just 0.5 seconds and demonstrates a high degree of reusability, repeatability, stability and reliability, making it a powerful tool for monitoring and ensuring safer water quality," said Khijwania. "In the future, this technology could make it much easier for people to check whether their drinking water is safe, potentially saving lives by preventing exposure to harmful arsenic levels."

A user-friendly yet accurate sensor

Although conventional spectroscopy methods for detecting arsenic are highly accurate and sensitive, they tend to require complex, bulky, expensive equipment that is time-consuming and complicated to use. To fill this critical gap, the researchers developed an optical fiber sensor that not only has a low detection limit but is also cost-effective and user-friendly enough for routine arsenic monitoring in drinking water.

To make the new sensor, the researchers coated the inside core of a fiber with gold nanoparticles and a thin layer of a unique nanocomposite composed of aluminum oxide and graphene oxide, which selectively binds to arsenic ions. A portion of the light traveling through the core also extends into the surrounding fiber cladding due to the evanescent wave created by total internal reflection. By removing the cladding from a small section of the fiber, the evanescent wave is exposed to the environment.

As light travels through the optical fiber, the evanescent wave interacts with gold nanoparticles, triggering localized surface plasmon resonance—a phenomenon where electrons on the nanoparticle surface collectively oscillate in response to specific light wavelengths. If arsenic is present, it will bind to the nanocomposite, causing a measurable shift in the surface plasmon resonance wavelength and enabling accurate detection of trace arsenic in water.

Thorough performance assessment

The researchers tested the sensor using varying concentrations of arsenic ion solutions, finding that it produced consistent and reliable detection of arsenic across the tested concentration range. After additional optimization, they tested other parameters, showing that the sensor produced consistent results during both low-to-high and high-to-low changes in arsenic ion concentration and achieved a fast response time of just 0.5 seconds.

The sensor exhibited a maximum resolution of ± 0.058 ppb of arsenic and showed negligible variations in results for samples with identical arsenic concentrations analyzed on four separate days over an 18-day period. The researchers also compared sensor measurements to those obtained with inductively coupled plasma mass spectrometry (ICP-MS), which is commonly used for arsenic measurements. The sensor showed a relative percentage difference of less than 5%, indicating strong agreement between the two methods.

To evaluate the real-world applicability of the sensor, the researchers tested it on drinking water samples collected from different locations in the city of Guwahati in India. The sensor maintained reliable performance under these varied conditions.

"These investigations established that the proposed optical fiber sensor offers a highly sensitive, selective, fast, cost-effective, straightforward and easy solution for arsenic detection in real field conditions," said Khijwania. "In the long term, this new approach could potentially be modified to create a new wave of affordable and accessible environmental monitoring tools."

The researchers note that although the sensor is ready for real-world use in detecting arsenic, a less expensive and easier-to-use optical source and detector would need to be developed to enable widespread application. -- TP